



Better Sleep. Better Health. Better Learning

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True or False

1. It doesn't matter when you sleep, so long as you do sleep
2. Everyone needs about 8 hours sleep per night
3. Sleep is as important to your physical and mental health as diet and exercise

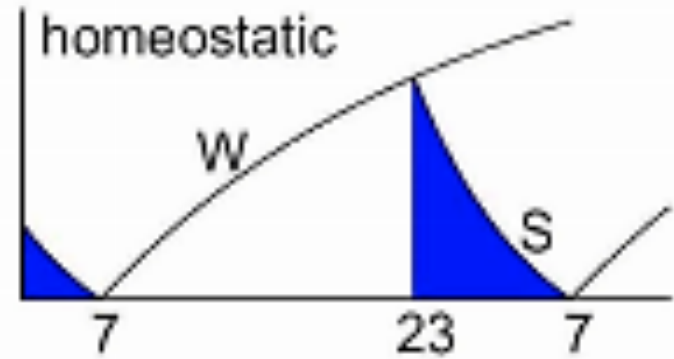


Workshop Structure

1. Physiology and developmental aspects of sleep
2. Common sleep problems and sleep disorders in children and adolescents
3. Bi-directional relationship between sleep, health, behaviour, and mood
4. How you can help improve sleep health in your students (and maybe yourselves)

Regulation of Sleep

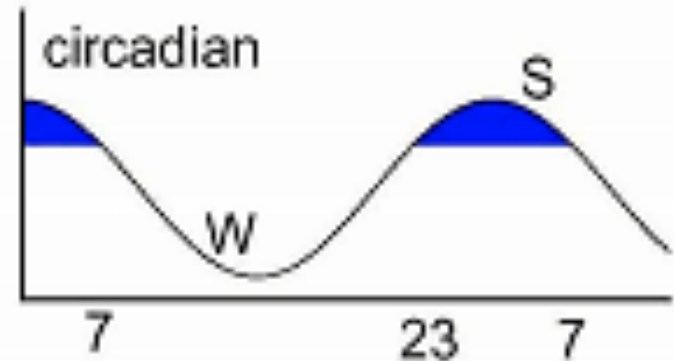
Sleep duration



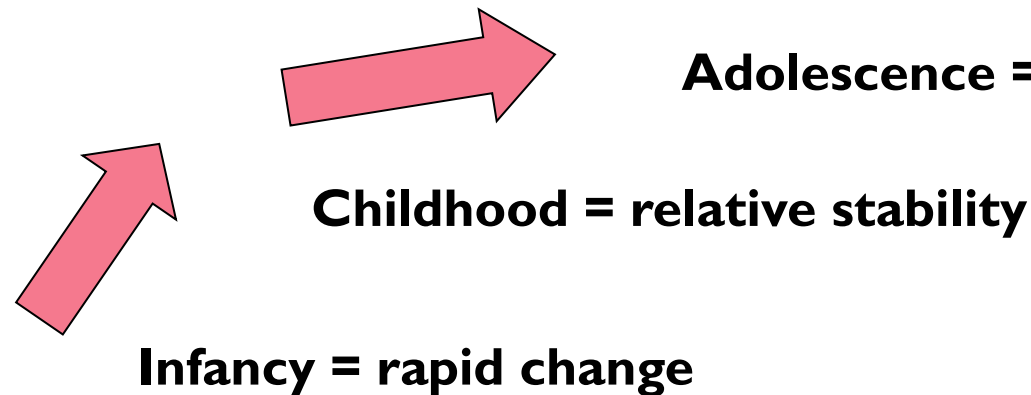
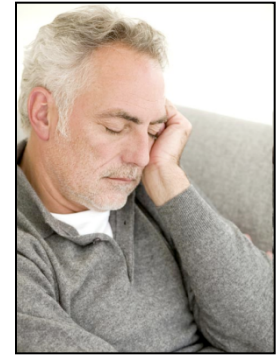
Sleep scheduling



- Timing of bed and rise times
over a sequential period



Development of Sleep

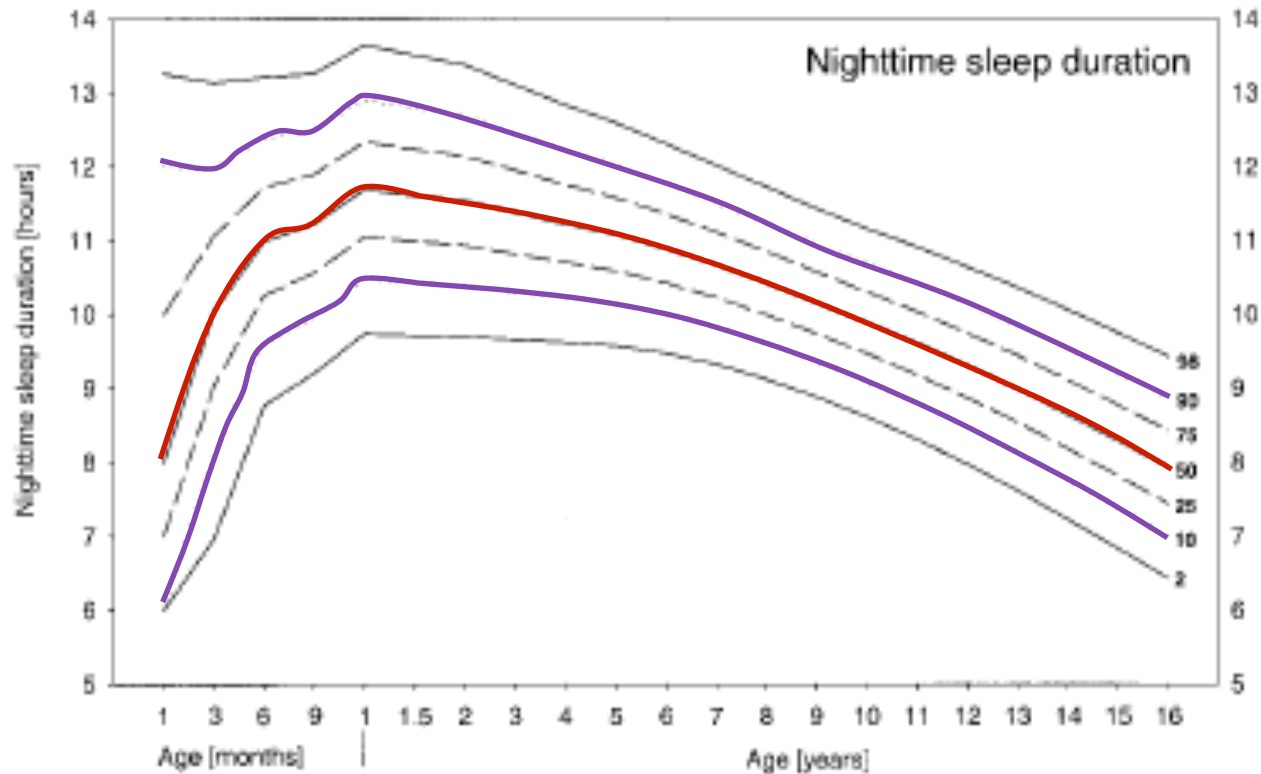


Sleep in Children

- Is at a lifetime maximum
 - 50% or more of each day
- Is essential for:
 - Brain maturation
 - Memory consolidation
 - Behaviour regulation
 - Growth and maintenance of body tissues
 - Regulation of metabolic hormones



How Much Sleep Do Children Need?



Recommendations for optimal sleep duration for children are based on averages

Is there a magic number?

JP – Japan
IN – India
KR – South Korea
TW – Taiwan
HK – Hong Kong
SG – Singapore
MY – Malaysia
CN – China
ID - Indonesia
PH – Philippines
TH – Thailand
CA – Canada
US – United States
VN – Vietnam
UK – United Kingdom
AU – Australia
NZ – New Zealand

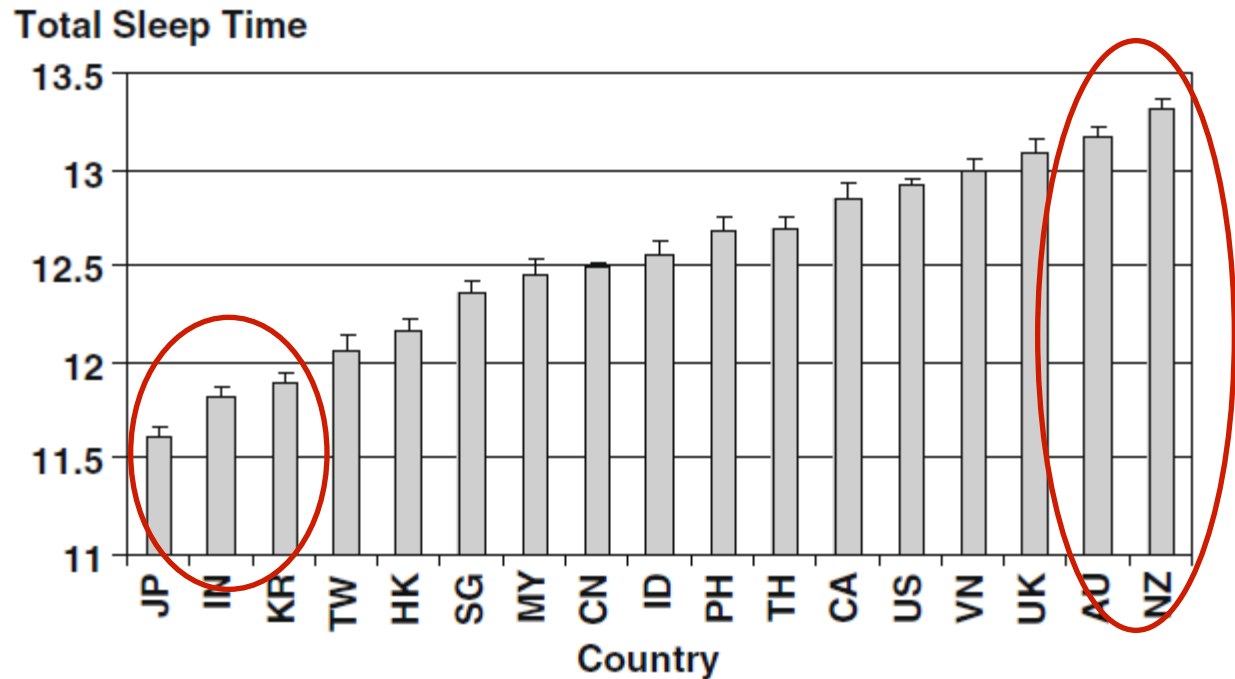



Fig. 1. Total sleep time across country.

Birth to 5 years


29,287 parents completed an online survey

Is there a magic number?


- Cross-sectional survey of demographics, sleep, activity, behaviour and general health
- 32 Schools (Public & Private)
- Final number = 1845
- Gender, socioeconomic and ethnicity differences in sleep in children aged 5-10 years




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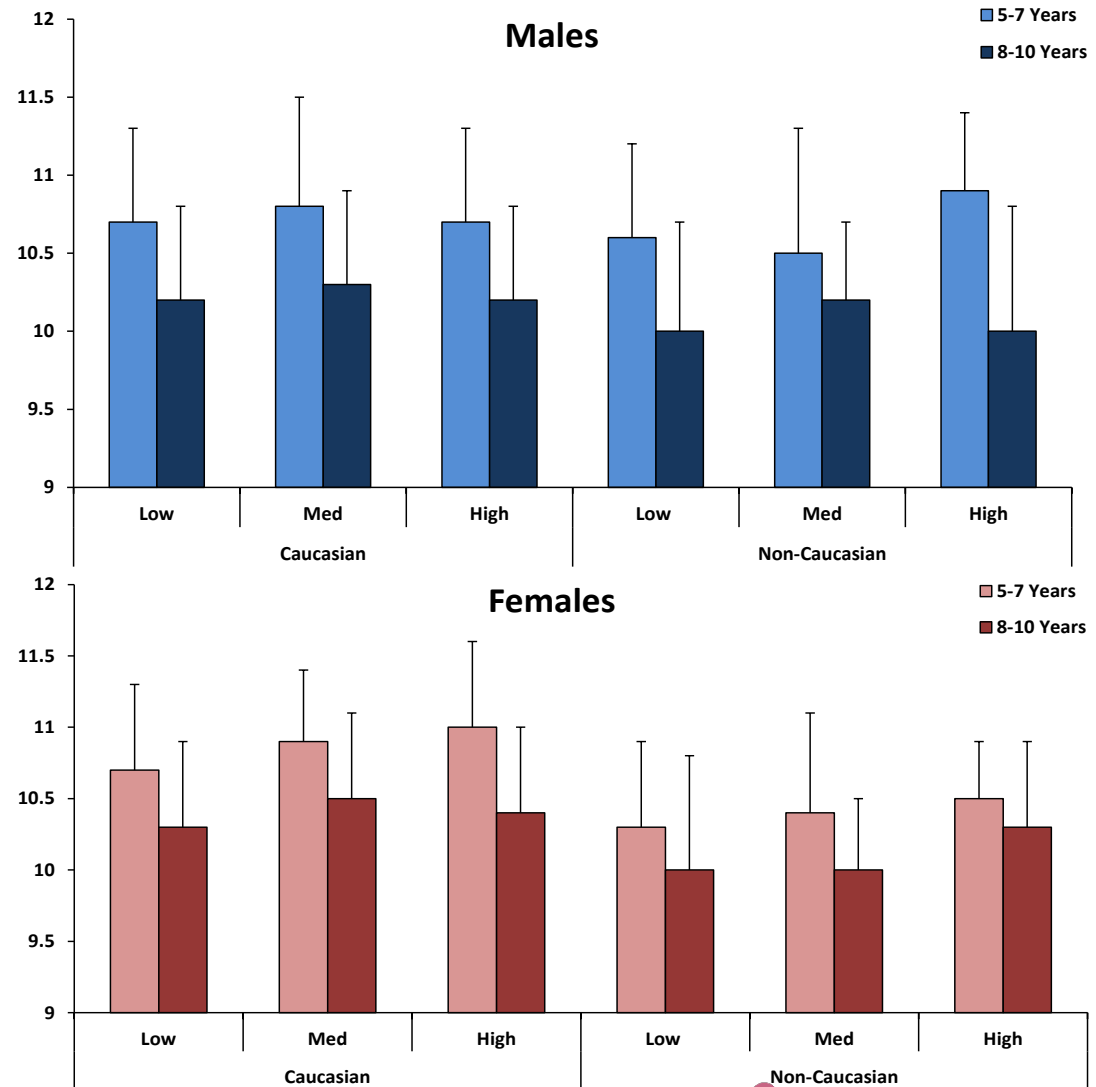
Child Sleep, Health and Behaviour Questionnaire

Thank you for your valuable time. By completing the following questionnaire, you agree to provide information about the sleep, health and behaviour of your child. All questions are voluntary, however we ask that you complete as much of the questionnaire as possible, as all information is useful.

Sleep Disorders Unit, WCH,
Level 2, Good Friday Building, 72 King William Road,
North Adelaide, South Australia 5006; Phone: 8161 6456.

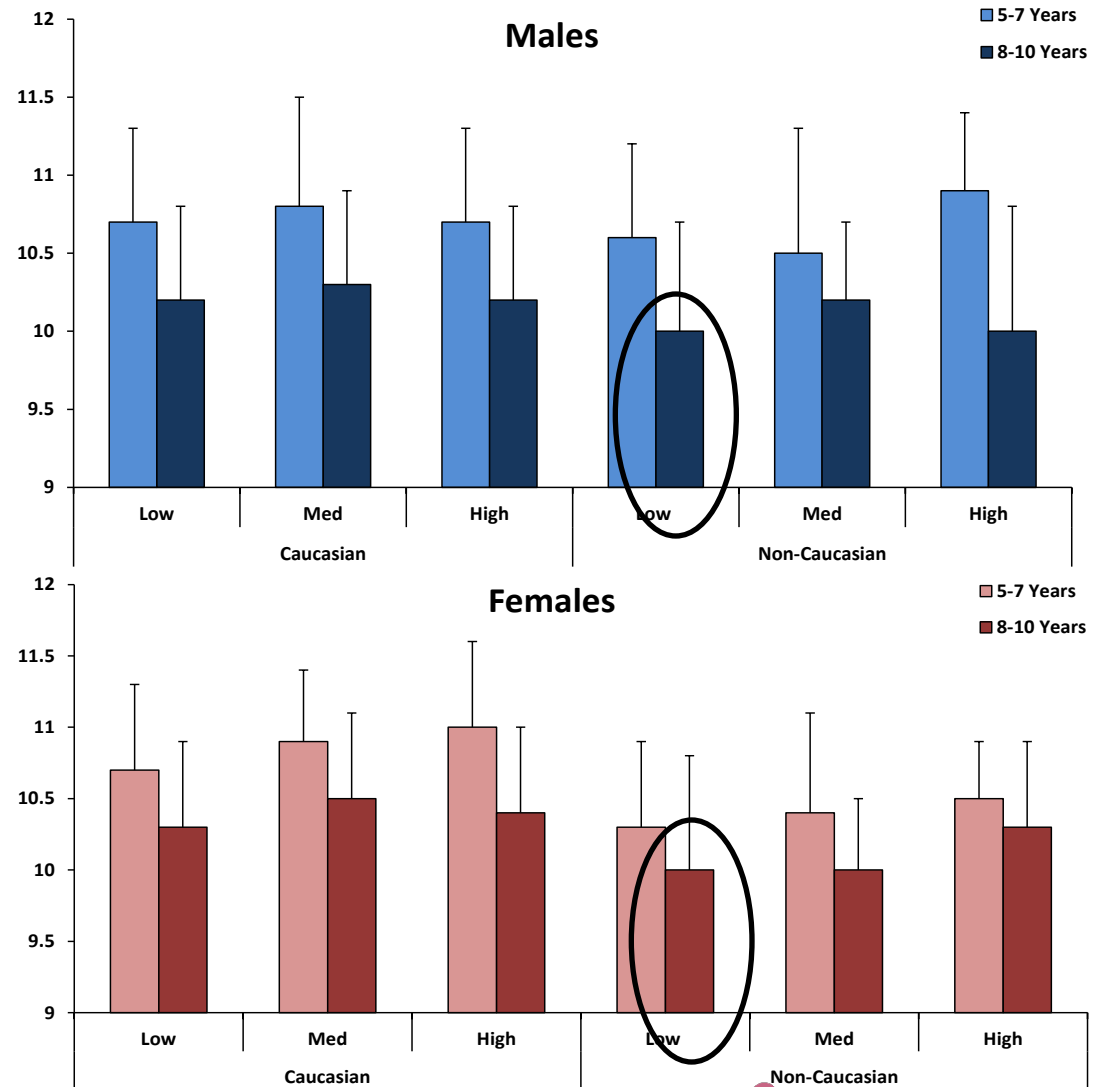
Is there a magic number?

- No gender difference
- Caucasian slept more than non-Caucasian children
- Children from low SES areas slept less than children from middle or high SES areas



Is there a magic number?

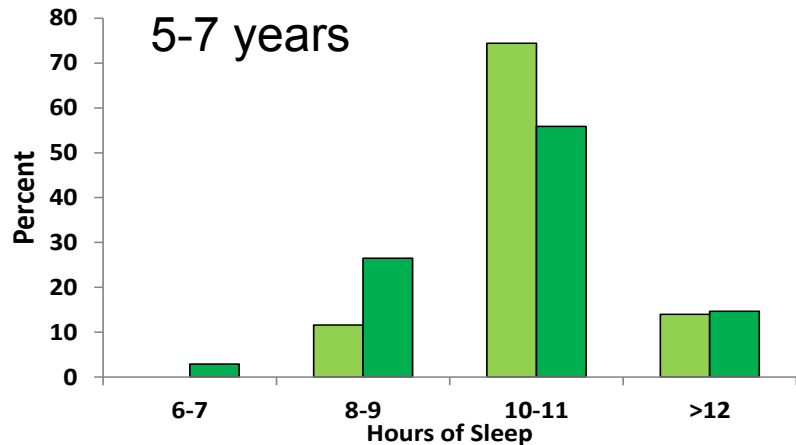
- Older non-Caucasian children from low SES reported the shortest sleep duration



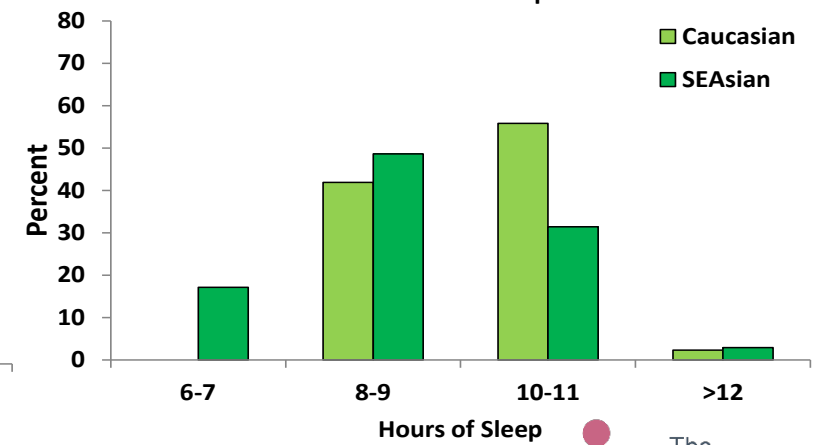
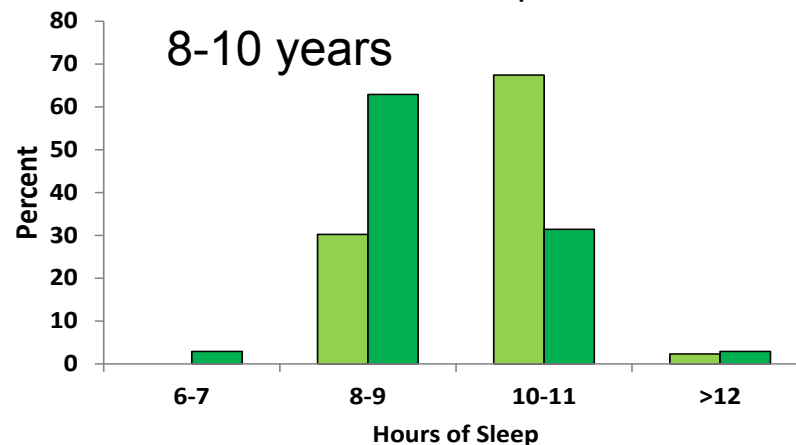
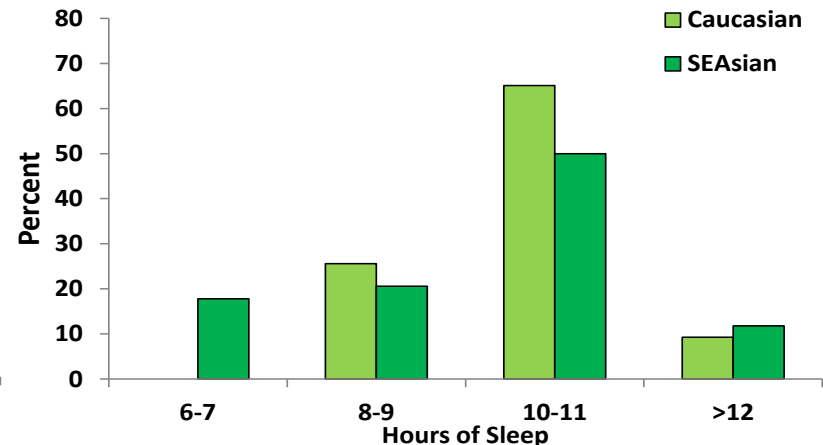
Is there a magic number?

How much sleep does your child need?

School Days (Sun-Mon)



Weekends (Fri-Sat)

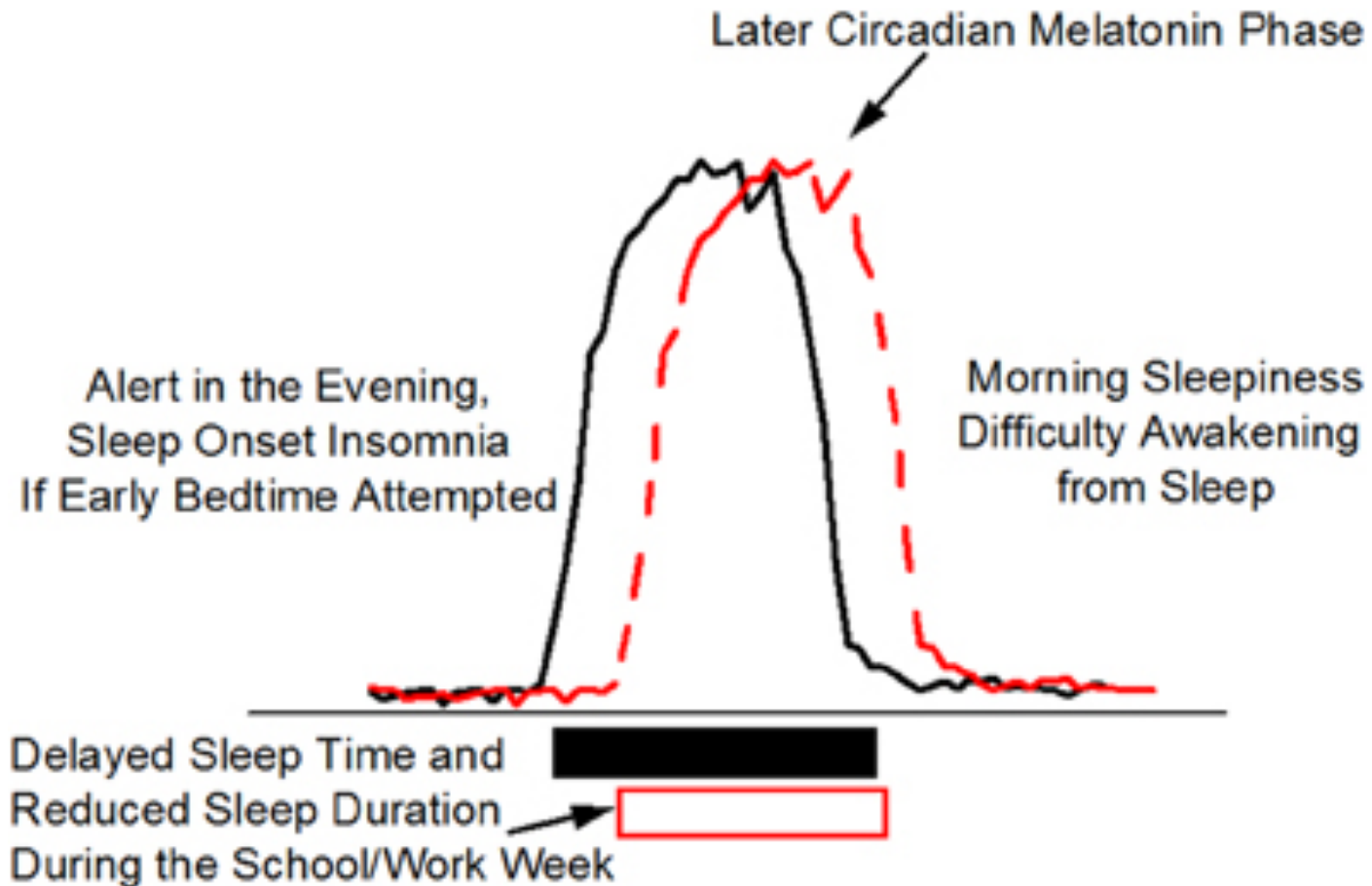


Sleep in Teens

- Delayed sleep onset
 - Circadian: relative phase delay at puberty

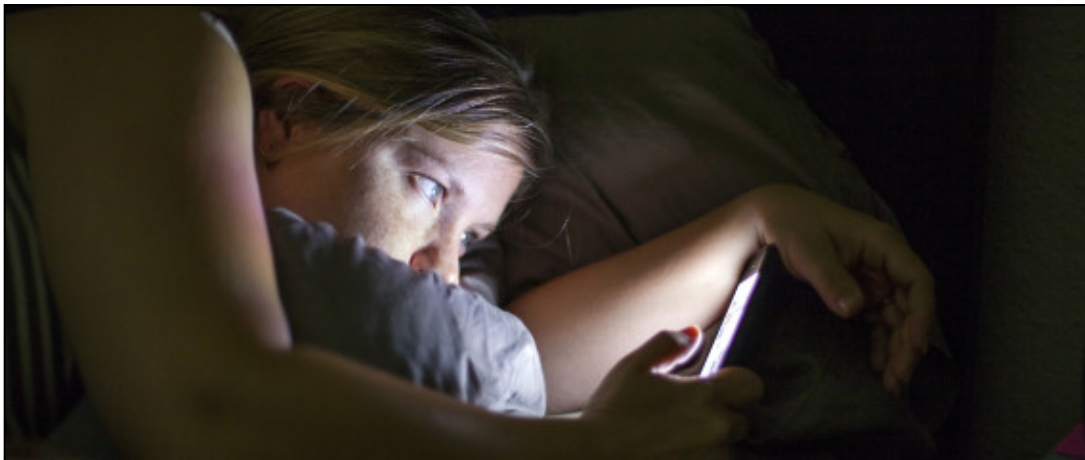


Phase Shift



Is there a magic number?

- Under free-running conditions, adolescents need 9.25 hours sleep for optimal performance, mood and alertness
- In USA, 62% of teens (Grade 9-12) reported getting less than 8 hours sleep
- Only 9% reported getting more than 9 hours



Recommended Sleep Duration

AGE	RECOMMENDED HOURS	INDIVIDUAL VARIATION	NOT RECOMMENDED
Preschool (3-5y)	10-13 (with or without a nap)	8 or more 14 or less	Less than 8 More than 14
Primary School (6-13y)	9-11	7 or more 12 or less	Less than 7 More than 12
High School (14-17y)	8-10	7 or more 11 or less	Less than 7 More than 11
Young Adult (18-25y)	7-9	6 or more 11 or less	Less than 6 More than 11
Adult (26-64y)	7-9	6 or more 10 or less	Less than 6 More than 10

Signs a child is not getting enough sleep



- Overactive
- Display inappropriate emotions
 - Inattentive
 - Learning difficulties





- Oppositional
- Defiant


Look familiar?

Sleep Duration and Behaviour


- 20% of children had a mean sleep duration ≤ 10 h
 - 18% Caucasian versus 37% non-Caucasian
- Children who slept < 10 h were almost **twice** as likely to display hyperactive behaviours than those who slept > 10 h

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Signs a child is not getting enough sleep



- Overactive
- Display inappropriate emotions
 - Inattentive
 - Learning difficulties



- Oppositional
- Defiant
 - Fall asleep at inappropriate times



Signs an adolescent is not getting enough sleep



- Fall asleep at inappropriate times

- Increased risk for mood disorders
- Withdrawal



- Poor concentration
- Decreased academic performance

- Increased risk of accidents



Your optimal sleep time

- A. What time would you go to bed if you were entirely free to plan your evening?
- B. What time would you get up in the morning if you were entirely free to plan your day?
- C. With all other things being normal, if you got into bed at 11pm, how tired would you be?
- D. With all other things being normal, if you had to get up at 5am, how long would it take you to get going?

Your optimal sleep time



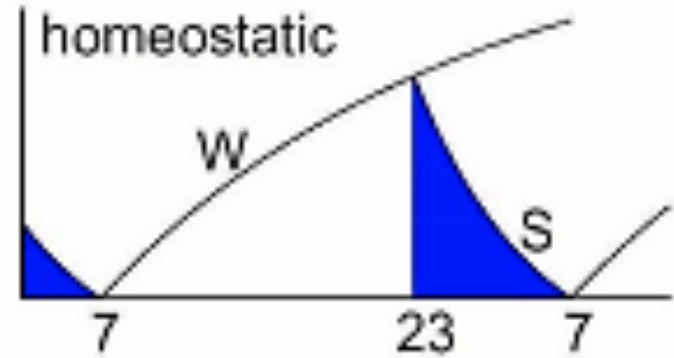
- A. Before 11pm
- B. Before 7am
- C. Very – extremely tired
- D. Less than 30 minutes



- A. After 11pm
- B. After 7am
- C. Not – a little tired
- D. More than 30 minutes

Regulation of Sleep

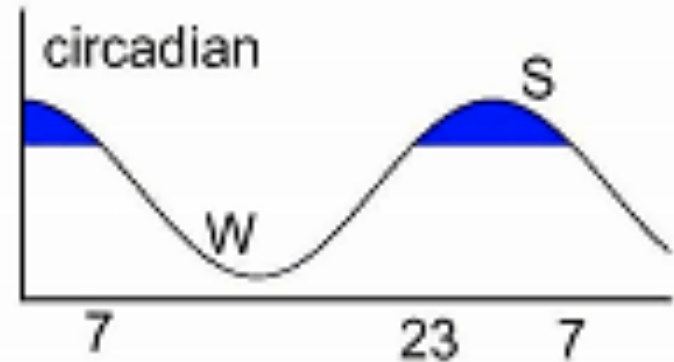
Sleep duration



Sleep scheduling



- Timing of bed and rise times
over a sequential period



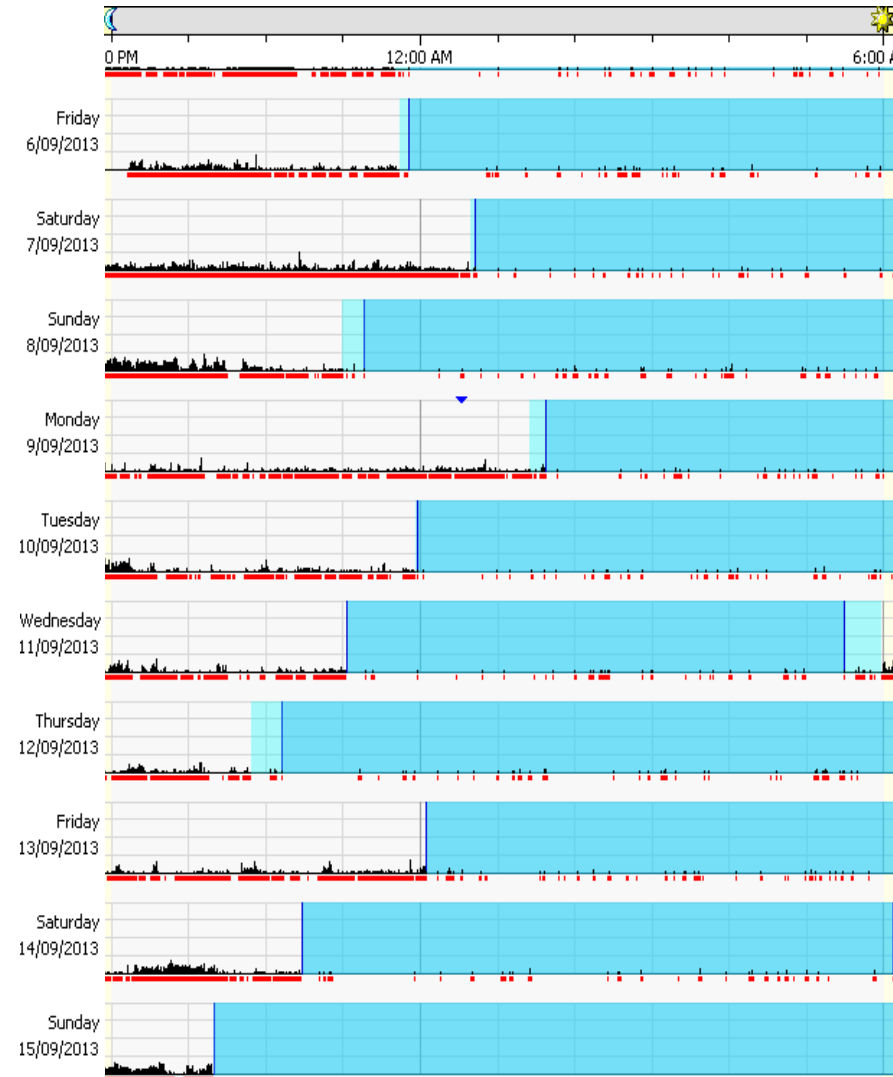
Sleep Scheduling

In adults:

- Consistent bedtimes show greater and longer lasting improvements in daytime sleepiness compared to maintaining recommended sleep duration (>7.5 h)

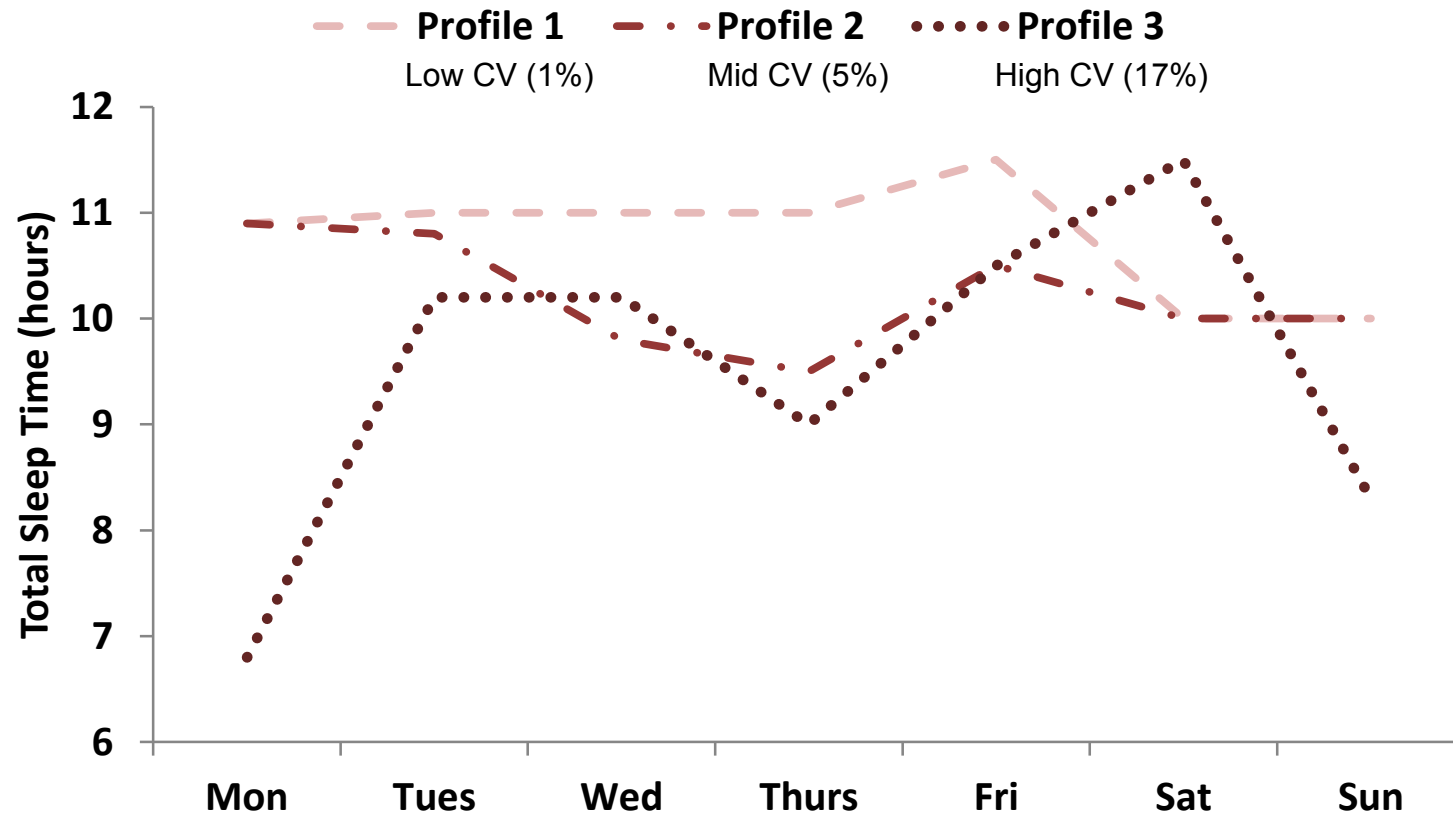
In adolescents:

- The greater the bedtime shift from school to weekend the greater the impact on daytime sleepiness, depressive mood and behaviour problems
- Inconsistent sleep/wake schedules are associated with poor academic performance



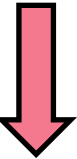
Sleep Scheduling

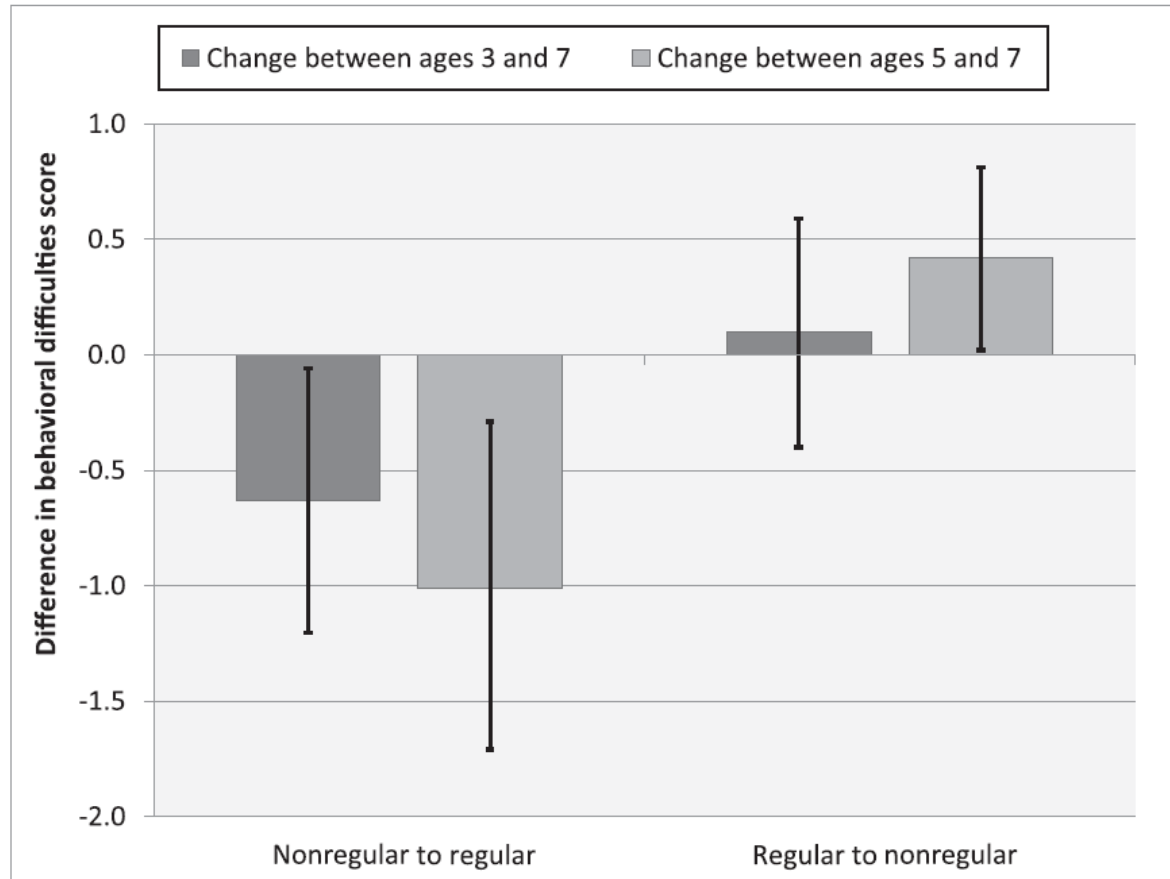
Variability in sleep duration across the week in three children matched for age and gender



Coefficient of variance (CV) – standardised measure of variability or dispersion

Sleep Scheduling and Behaviour


Better
behaviour



Longitudinal study of >10,000 children from 3 to 7 years

Sleep Scheduling and Behaviour

Compared to children with a bedtime variability of <30 minutes

- Children with a bedtime variability of 61-90 minutes were almost **three times** as likely to display hyperactive behaviours
- Children with a bedtime variability >120 minutes were
 - **six times** as likely to display hyperactive behaviours
 - **twice** as likely to display internalising behaviours

20% slept <10 hours

41% had a bedtime variability >60 minutes

Are our kids jetlagged?

Jetlag occurs when the body clock is out of sync with the environmental clock due to a change in time zone

- Extreme tiredness
- Fuzzy headedness
- Poor concentration
- Irritability

Social jetlag occurs when the body clock is forced out of sync by everyday activities

A 2-hour difference in bedtime is equivalent to flying to the East Coast two to three times per week.



Signs a child is not getting regular sleep



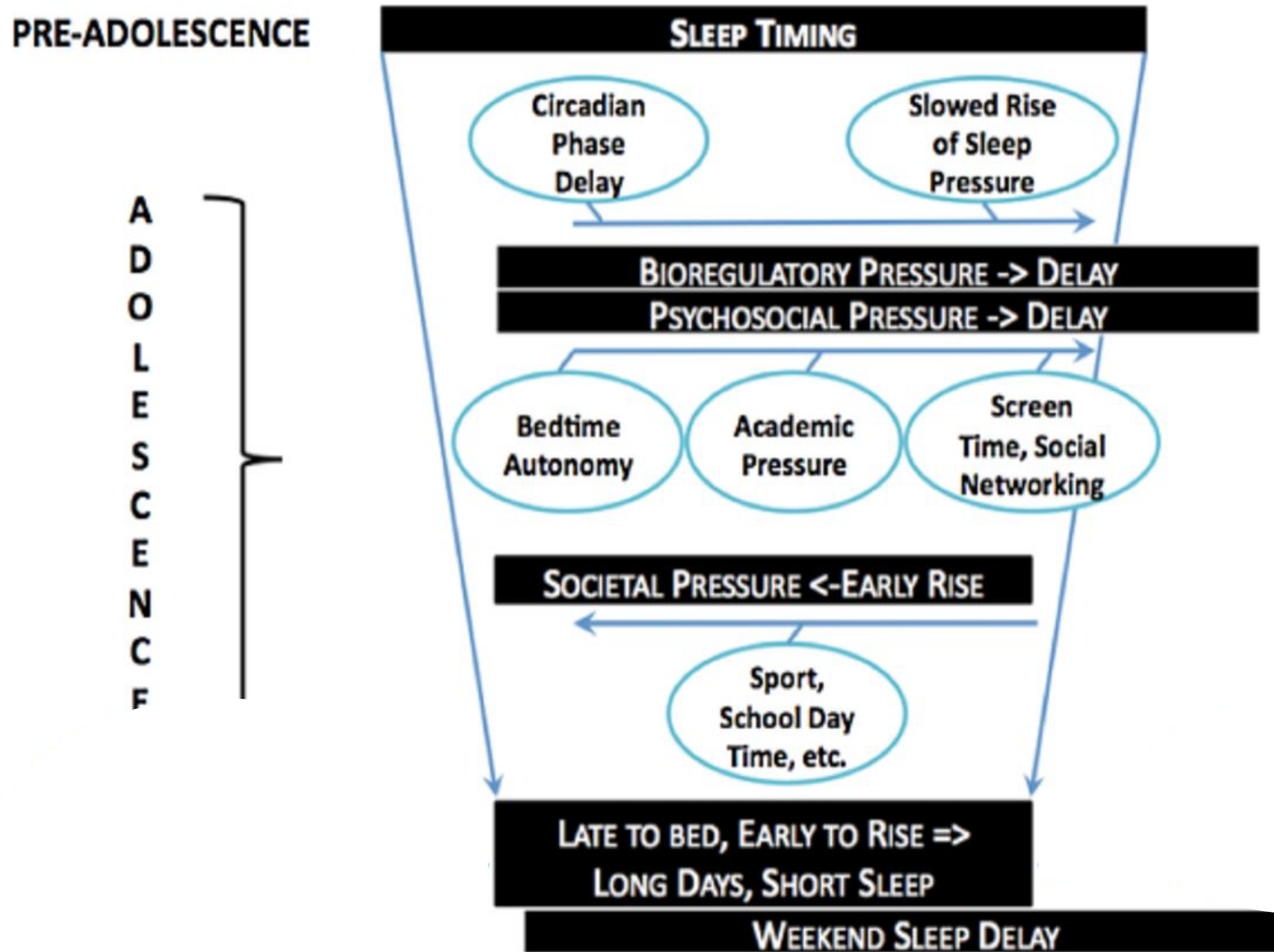
- Overactive
- Display inappropriate emotions
 - Inattentive
 - Learning difficulties



- Oppositional
- Defiant
 - Fall asleep at inappropriate times



Adolescence: The Perfect Storm



Signs an adolescent is not getting regular sleep



- Fall asleep at inappropriate times

- Increased risk for mood disorders
- Withdrawal

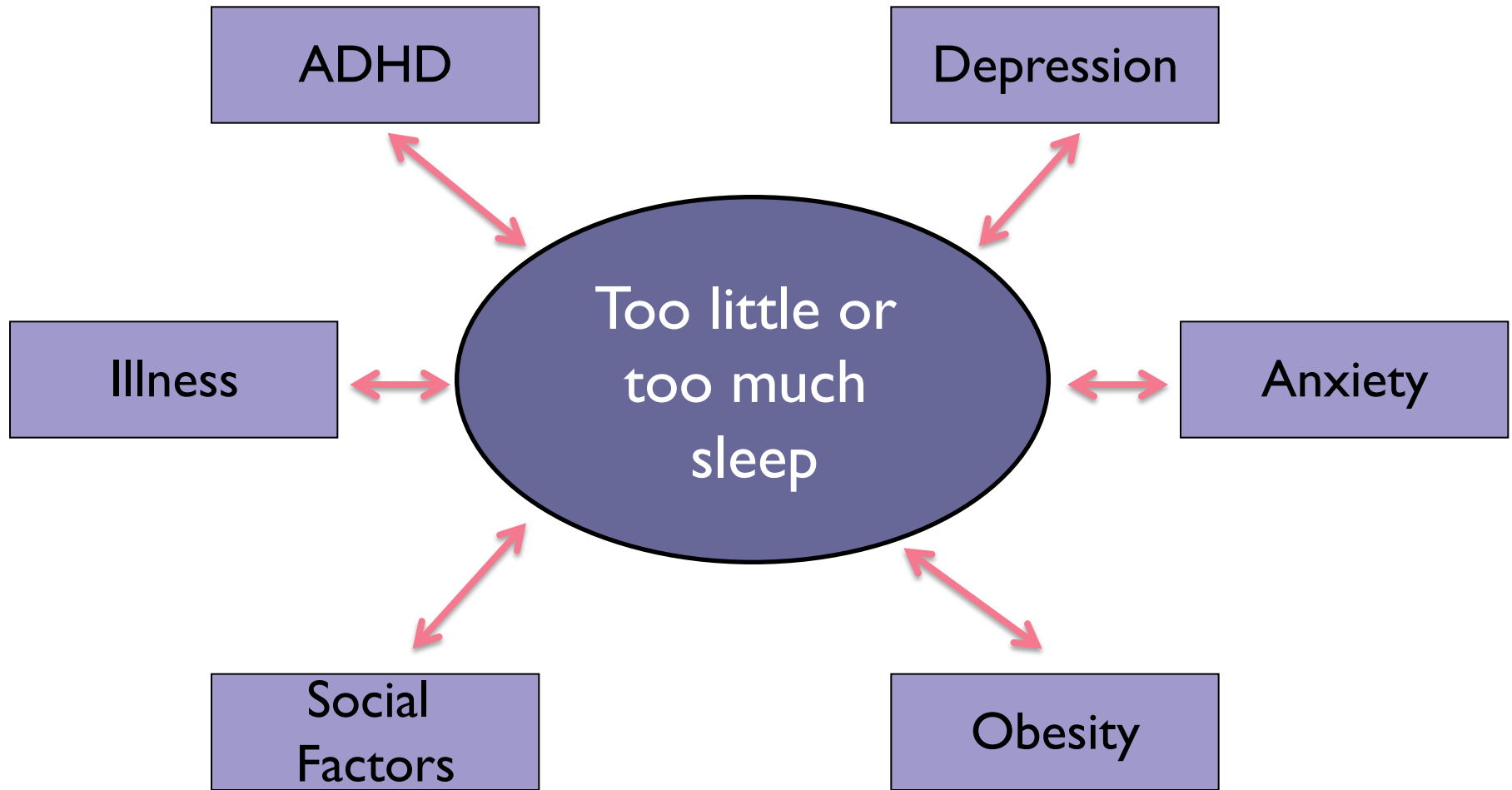


- Poor concentration
- Decreased academic performance

- Increased risk of accidents



Bi-Directional Associations



Medication and Sleep

MEDICATION	CLASS	EFFECT ON SLEEP
Antidepressants	Tricyclic	Most will increase total sleep time, but decrease rapid eye movement sleep Some will decrease total sleep time
	Serotonin inhibitors	Will decrease total sleep time
	Serotonin agonists	Will increase total sleep time
Antipsychotics	Typical or Atypical	Will increase total sleep time, increase deep sleep and decrease rapid eye movement sleep
Stimulants	Methylphenidate (Ritalin) and Dextroamphetamine	Increases sleep fragmentation (awakenings and movement) and decreases sleep quality

Common Sleep Disorders

Parasomnias

- associated with arousal and sleep-state transitions

Dyssomnias

- associated with initiating and/or maintaining sleep or producing excessive daytime sleepiness



Common Sleep Disorders

Parasomnias

- Sleep walking
- Night terrors
- Sleep talking
- Bedwetting
- Rhythmic movement disorders (e.g. head banging)

Dyssomnias

- Sleep apnoea
- Narcolepsy
- Restless leg syndrome
- Insomnia
- Delayed sleep phase syndrome

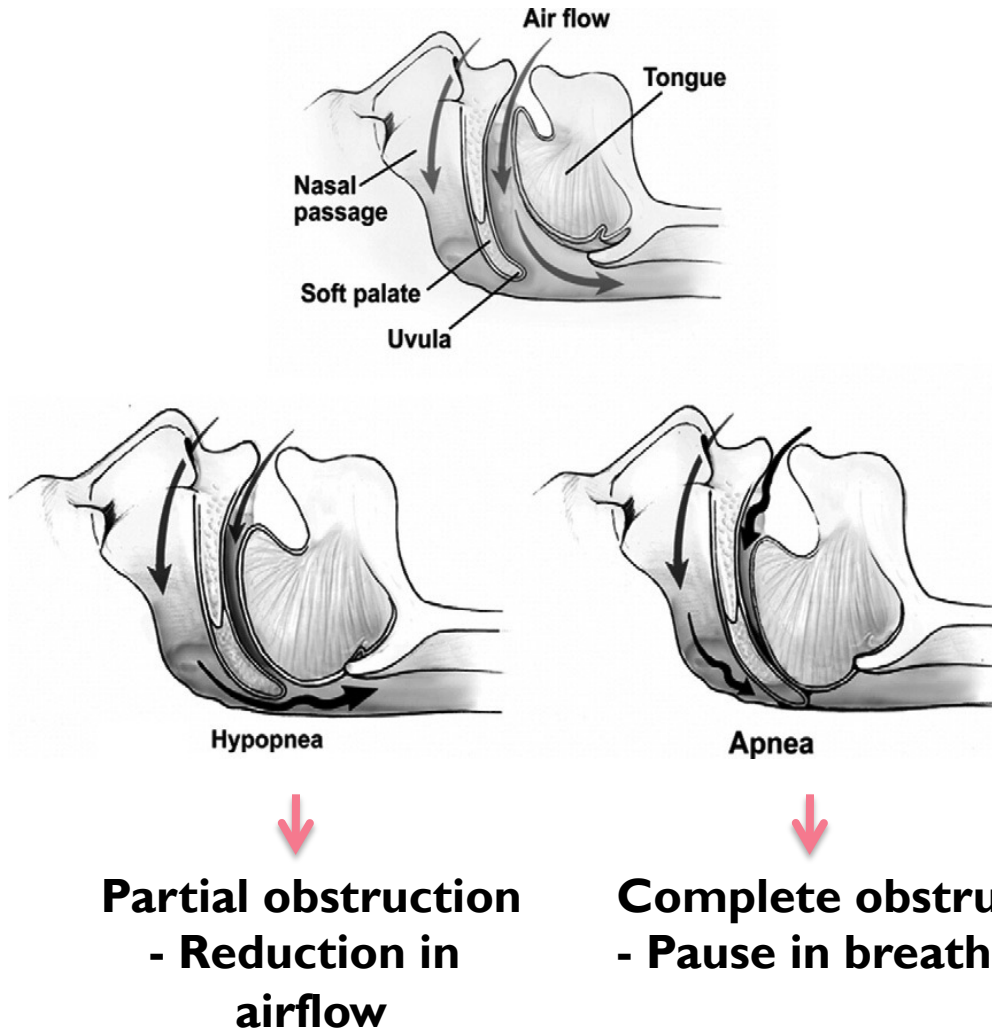
There are approximately 90 classified childhood sleep disorders and it is estimated that 40% of children will have one or more of these

Sleep Disordered Breathing in Children

Major cause in children:
Enlarged tonsils and adenoids

Prevalence:

- 15% of children aged 3-12 years

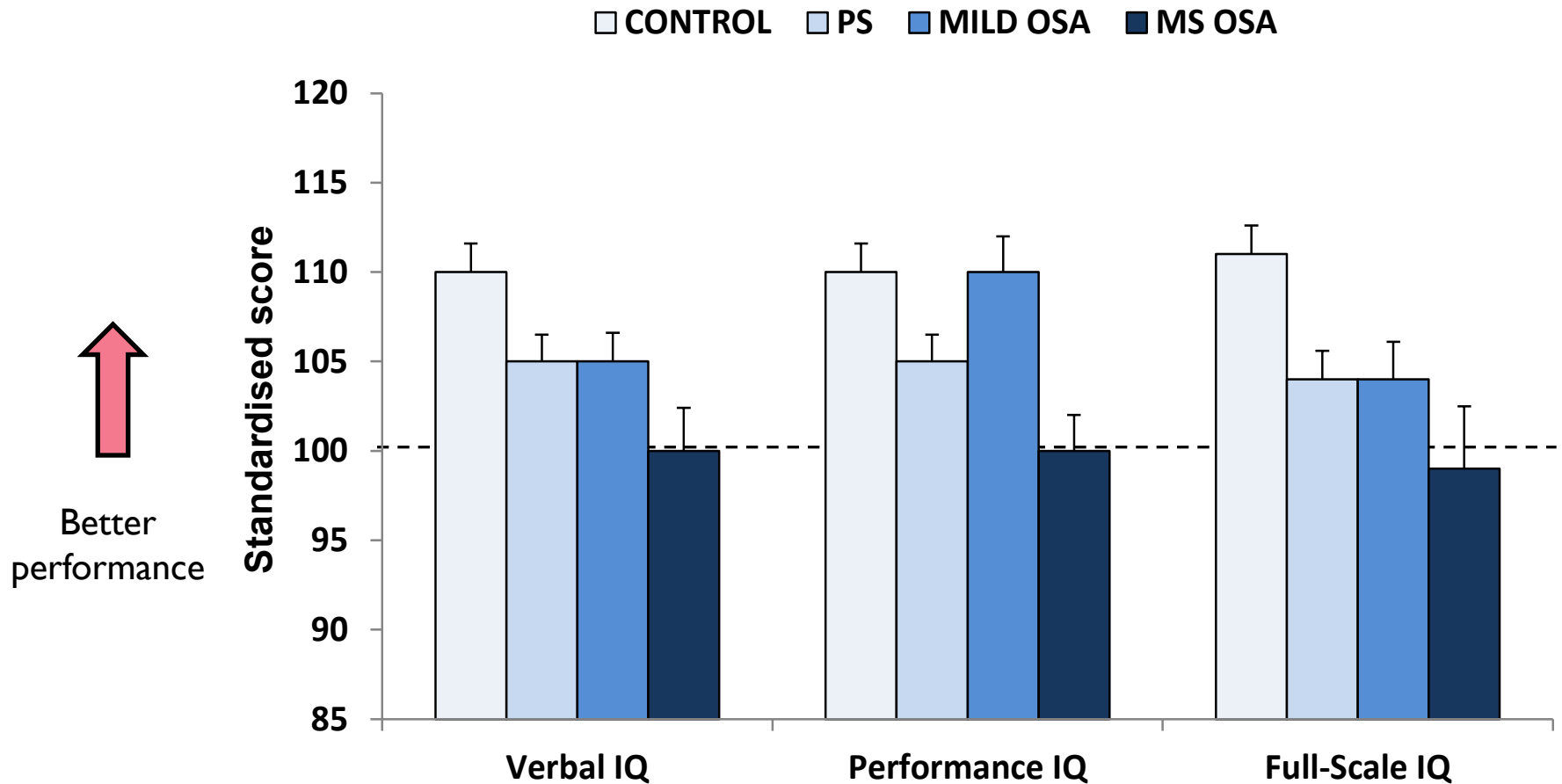


Partial obstruction
- Reduction in
airflow

Complete obstruction
- Pause in breathing

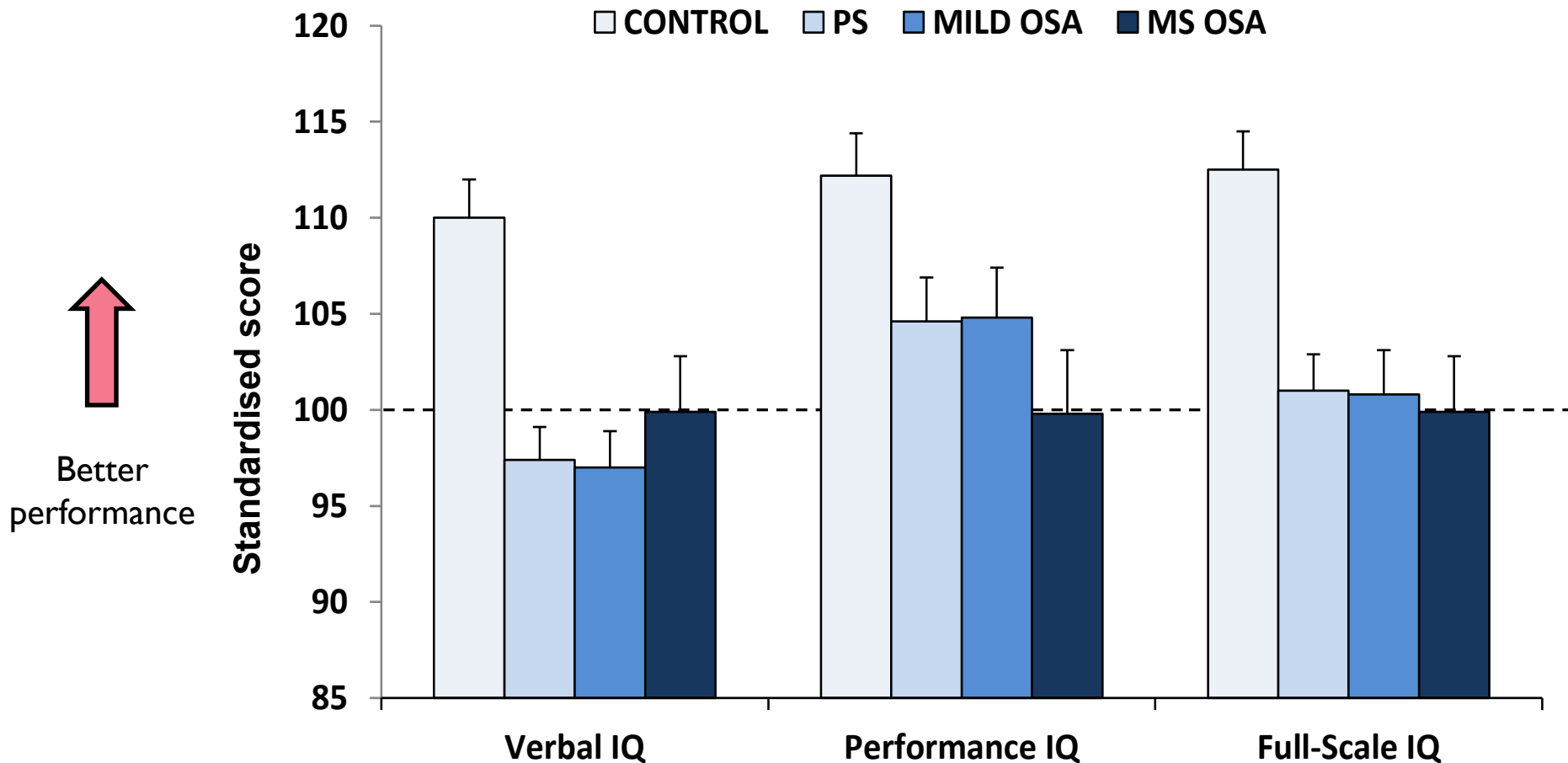
Sleep Disordered Breathing and Cognition

3-5 years

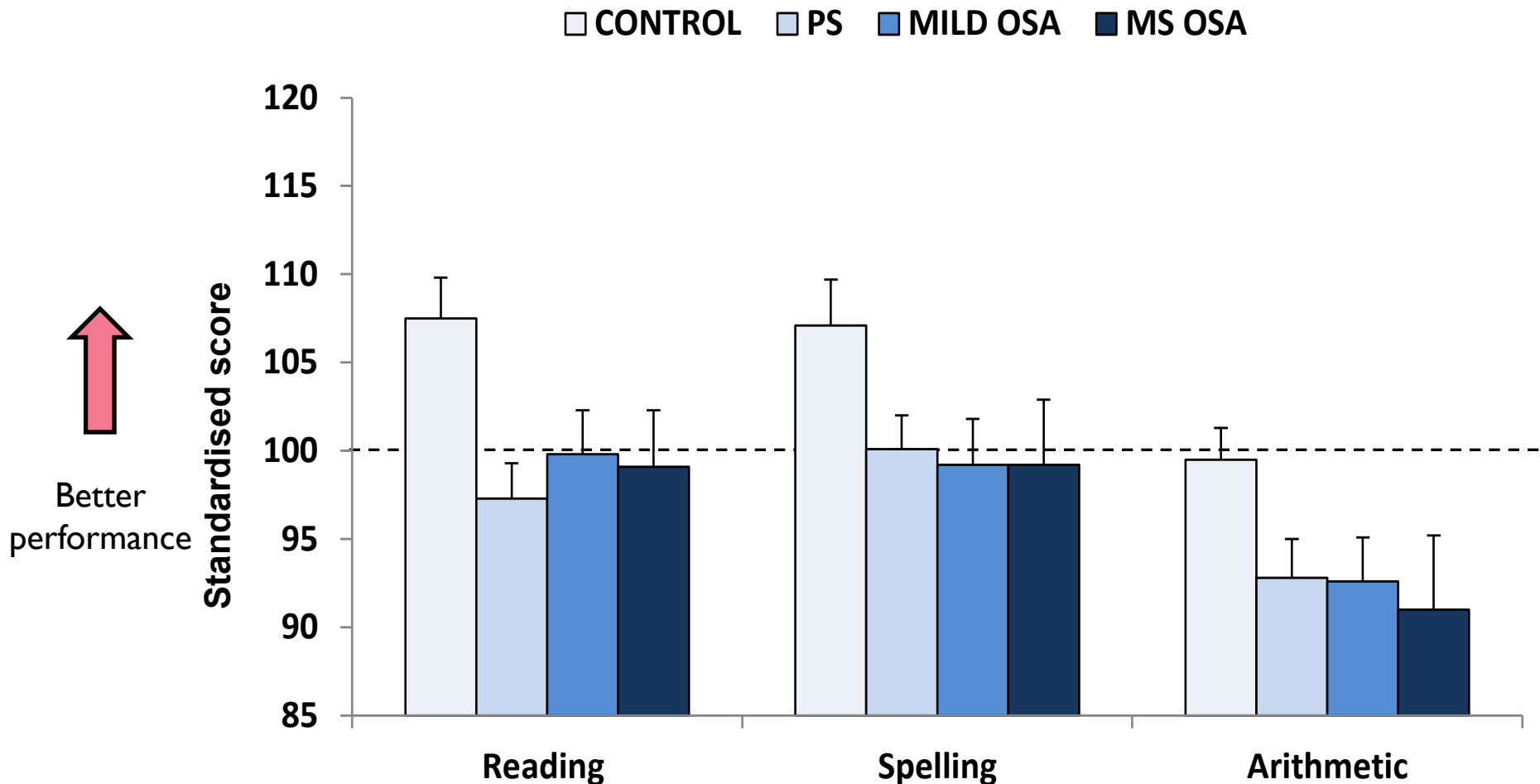


25-30% of MS OSA had clinically significant scores (<85) compared to 5-12% of control, PS and Mild OSA

Sleep Disordered Breathing and Cognition 7-12 years



Sleep Disordered Breathing and Academic Performance 7-12 years



17-25% of PS, 13-25% of Mild OSA and 16-45% of MS OSA had clinically significant scores (<85) compared to 5-10% of control

Signs a Child has a Sleep Disorder



- Overactive
- Display inappropriate emotions
 - Inattentive
 - Learning difficulties

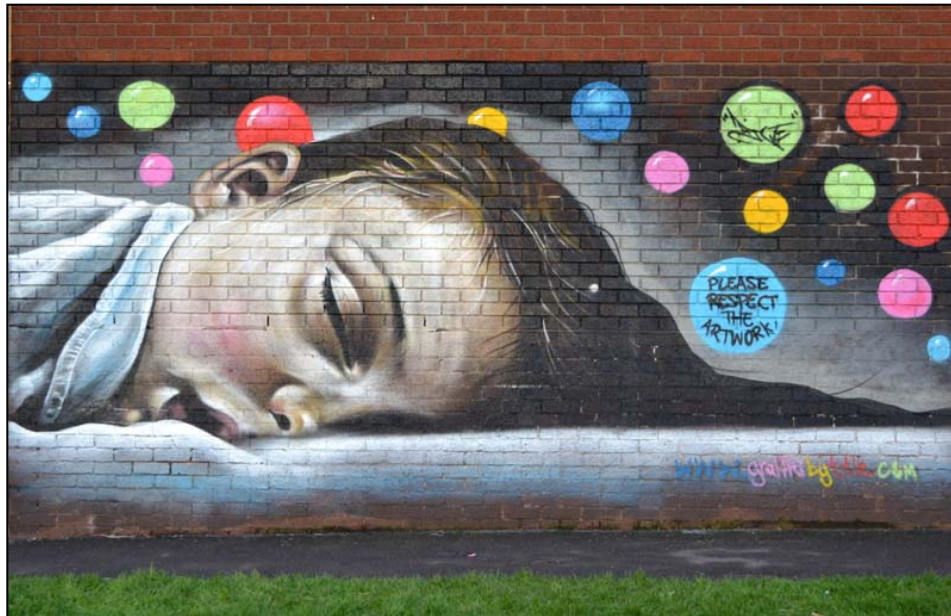


- Oppositional
- Defiant
- Fall asleep at inappropriate times



What can you do?

1. Ask the child about their sleep
2. Discuss the importance of sleep for daytime performance
3. Incorporate healthy sleep into lesson plans
4. Allow the child to see the difference between a good night's sleep and a poor night's sleep
5. Discuss sleep health with parents



Improving Sleep Health



The screenshot shows a web browser window with the URL <http://sleephealthfoundation.org.au/childrens/world-sleep-day.html>. The page features a header with the Sleep Health FACTS logo and a navigation bar. The main content area is titled "Teacher Resources" and includes a paragraph about the importance of sleep, a list of downloadable resources, and a disclaimer.

Created: Wednesday, 11 March 2015 14:21 | Last Updated: Thursday, 30 July 2015 10:18 | [Print](#)

Teacher Resources

Focusing on sleep is crucial because research shows that not getting enough sleep or not sleeping well affects learning, behaviour, mood and overall well-being.

This sleep education program has been released in conjunction with World Sleep Day and aims to teach students why sleep deserves its place alongside diet and exercise as one of the pillars of good health.

The following resources are free for you to download and use:

- Activity : Morning-Evening questionnaire [\[pdf\]](#)
- Activity : My sleep friendly bedroom [\[pdf\]](#)
- Online activity : Sleep in teenage years [\[pdf\]](#)
- Science of sleep : crossword activity [\[pdf\]](#)
- Sleep diary activity instructions [\[pdf\]](#)
- Sleep diary for teenagers - week one [\[pdf\]](#)
- Sleep diary for teenagers - week two [\[pdf\]](#)
- Sleep Clock [\[pdf\]](#)
- World Sleep Day presentation slides - Ages 5-10 years [\[slides\]](#)
- World Sleep Day Presentation slides - Ages 11 - 17 years [\[slides\]](#)
- World Sleep Day teacher notes - Ages 5-10 years [\[pdf\]](#)
- World Sleep Day teacher notes - Ages 11-18 [\[pdf\]](#)

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<http://sleephealthfoundation.org.au/childrens/world-sleep-day.html>

Improving Sleep Health in Children

1. Ensure the child has enough opportunity to sleep
2. Ensure a regular sleep pattern and consistent pre-sleep routine
3. NO electronics in the bedroom
4. Minimum of 30 minute electronic free-zone prior to bed
5. No caffeine two hours before bed
6. Keep lights low in bedroom
7. If suspect the child has a sleep disorder, get a referral to see a sleep specialist

Improving Sleep Health in Teens

1. Don't force sleep, but don't sabotage it either
2. Ensure a regular sleep pattern and consistent pre-sleep routine
3. Minimum of 30 minute electronic free-zone prior when want to go to sleep
4. No caffeine two hours before bed
5. Make sure phone is on silent (preferably out of the room) when sleeping
6. If needed, allow catch-up sleep on the weekend – BUT do not go to bed later
7. If suspect the teen has a sleep disorder, get a referral to see a sleep specialist

True or False

1. It doesn't matter when you sleep, so long as you do sleep **FALSE**
2. Everyone needs about 8 hours sleep per night **FALSE**
3. Sleep is as important to your health as diet and exercise **TRUE**



Thank You and Sleep Well

